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PATENT SPECIFICATION

NO DRAWINGS

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COMPLETE SPECIFICATION

Improvements in the Treatment of Leather

We, MO OCH DOMSJÖ AKTIEBOLAG, a Swedish Body Corporate, of Ornsköldsvik, Sweden, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a process of treating leather as well as to an adhesive composition suitable for use in the process.

In the processing of leather, the "nailing" of the leather, i.e. attaching and tensioning of the leather on wooden frames to dry the leather, has nowadays been abandoned to a large extent. Instead, the leather sheet is pasted to a plate of glass or other material so that it is firmly tensioned during the drying process, and once the leather is dry it is removed from the plate. The finished leather thereby obtains a suitably adapted stretch. This improved method of treatment is referred to as the "pasting method".

The pasted leather sheet should be well attached to the glass plate over its entire area so that it is maintained smooth, but it should be readily removable when the treatment is finished. Thus, to be suited for use in this treatment, the paste must be easy to spread, should adhere will to the glass and the leather both in the wet and dried state, and should be capable of being removed by simple means.

Hitherto, the paste usually used for pasting leather has consisted substantially of starch, sometimes with additions of cellulose derivatives. Such a paste is not satisfactory, however, in particular because it is difficult to remove is completely from the leather, so that spots thereof remain on the leather. This has *inter alia* the disadvantage that if the leather is dyed, the dye does not become well affixed on the points where paste spots remain, but eventually falls off, spoiling the appearance of the finished leather product.

An object of the present invention is to provide a method of pasting leather by the aid of a paste which well satisfies the above requirements and is free from the disadvantages of previously used pastes.

The process of the invention comprises a method of treating leather, which comprises applying to a sheet of leather a thin layer of an adhesive composition comprising as essential constituents a water-soluble cellulose derivative and a water-soluble polyhydric alcohol having 2—6 hydroxyl groups in the molecule or monoether of such an alcohol, the said polyhydric alcohol or ether having a viscosity not above 100 centistokes at 99°C., adhering the sheet of leather by means of the adhesive composition to a plate, and drying the leather and the composition.

The water-soluble polyhydric alcohol is preferably a polyalkylene glycol having a viscosity of not more than 100 centistokes at 99°C. These polyalkylene glycols at normal temperatures are liquid to pasty substances which are soluble in water. In admixture with a water-soluble cellulose derivative, e.g. a water-soluble ethyl-hydroxyethylcellulose or methylcellulose, they have been found to give excellent results. The mixture can be applied dissolved in water or in a mixture of water and a water-miscible organic solvent, such as a monohydric alcohol, and provides excellent adhesion both before and after it is dried. Since it is entirely soluble in water, it can easily be removed completely by treating the leather with water, and leaves no spots at all.

The polyalkylene glycol is preferably a polyethylene glycol having a molecular weight of 200 to 5000, but polypropylene glycols and mixed polyethylene-polypropylene glycols and also satisfactory. Polybutylene glycols of somewhat lower molecular weight, such that they

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are soluble in water, are also satisfactory. Water-soluble monoethers of these polyalkylene glycols, such as the lower alkyl ethers, can also be used. Instead of polyglycols it is also possible to use other polyhydric alcohols having 2 to 6 hydroxyl groups and a viscosity of not more than 100 centistokes at 99°C., such as glycerol, sorbitol, mannitol, neopentyl glycol, trimethylolpropane, as well as monoethers thereof, preferably lower alkyl monoethers.

As the water-soluble cellulose derivatives ethyl-hydroxyethylcellulose and hydroxyethylcellulose have been mentioned above. Other useful cellulose derivatives include non-ionic cellulose ethers, such as hydroxyalkylcelluloses, e.g. hydroxypropylcellulose, hydroxyethylhydroxypropylcellulose; alkylcelluloses, e.g. ethylcellulose, methylcellulose, methyl-ethylcellulose; mixed alkyl-hydroxyalkylcelluloses, e.g. ethyl-hydroxypropylcellulose; ionic cellulose ethers, e.g. carboxymethylcellulose, sulphomethylcellulose, sulphoethylcellulose; mixed ionic-no-ionic cellulose esters, e.g. hydroxyethyl-carboxymethylcellulose; and cellulose esters, e.g. cellulose sulphate.

The water-soluble cellulose derivative and the polyhydric alcohol or ether thereof can be used in a weight ratio of from 1:10 to 3:1. They may be dissolved separately in water or other suitable solvent therefor to form concentrated solutions which are then mixed and diluted to a suitable concentration, usually 2 to 5% by weight of the water-soluble cellulose derivative and 2 to 20% of the polyhydric alcohol or ether thereof, or the two ingredients may be mixed in the absence of any solvent to form a solid or semi-solid mixture, wherein the alcohol is more or less absorbed in the cellulose derivative, which can then be dissolved in water for use. Other additives can be added to the mixture as desired, e.g. wetting agents, preserving agents and dyes.

The solution can be applied to the leather sheet as a thin layer by means of brushes, rollers or other suitable means, whereupon the leather sheet is affixed to a plate of glass or other suitable material and tensioned to the desired extent. The paste and leather are then dried, preferably at about 30° to 50°C. After the leather sheet has been dried to the desired extent, it is removed from the plate, and freed from any paste remaining on it by applying water in any suitable way.

The invention is illustrated by the following Examples, in which all parts and percentages are by weight.

EXAMPLE 1

3 parts of water-soluble ethyl-hydroxyethylcellulose (viscosity 1200 centipoises in 2% aqueous solution at 25°C.) were dissolved in 90 parts of water, and 10 parts of polyethylene glycol having an average molecular weight of 600 (and a viscosity at 99°C of 10 centistokes) were added. The solution was spread on leather at room temperature and the leather was adhered to a glass plate. Drying was carried out at 50°C. The leather adhered well and evenly to the glass plate both before and after drying. It was easily removed by applying water, which dissolved the paste completely and did not leave any paste spots.

EXAMPLE 2

4 parts of water-soluble ethyl-hydroxyethylcellulose (viscosity 600 centipoises in 2% aqueous solution at 25°C.) were mixed with 6 parts of polyethylene glycol having an average molecular weight of 2000 (viscosity at 99°C 40 centstokes). A powder was obtained, wherein the polyethylene glycol was absorbed in the cellulose ether. This powder was dissolved in 90 parts of water and used in the same way as in Example 1 with similar results.

EXAMPLE 3

4 parts of water-soluble hydroxyethylcellulose (viscosity 6000 centipoises at 25°C. in 2% aqueous solution) were mixed with 4 parts of polyethylene glycol having a molecular weight of 1000 (viscosity at 99°C 17 centistokes). This mixture was dissolved in 90 parts of water, and used for pasting leather in the manner described in Example 1, with similar results.

EXAMPLE 4

3 parts of ethyl-hydroxyethylcellulose of the same type as in Example 1 were dissolved in 90 parts of water. To the solution, 10 parts of triethylene glycol monomethyl ether (viscosity at 99/°C 5 centistokes) were added. When used for pasting leather as described in Example 1, this solution gave similar results.

EXAMPLE 5

4 parts of ethyl-hydroxyethylcellulose of the same type as in Example 1 were mixed with 6 parts of glycerol. A tacky powder was obtained, which was dissolved in 90 parts of water to form a solution, which was used for pasting leather as described in Example 1 and gave similar results.

EXAMPLE 6

3 parts of ethyl-hydroxyethylcellulose of the type referred to in Example 1 were mixed with 10 parts of sorbitol, and the mixture was dissolved in 90 parts of water. The solution was used for pasting leather as described in Example 1 and gave similar results.

EXAMPLE 7

3 parts of ethyl-hydroxyethylcellulose of the type referred to in Example 1 were dissolved in 90 parts of water. To the solution, 10 parts of mixed polypropylene-polyethylene glycol having a viscosity of 68 centistokes at 99°C. were added. When used for pasting

leather in the manner described in Example 1, this solution gave similar results.

EXAMPLE 8

A mixture of 1 part of *p*-nonylphenol polyglycol ether (i.e. an adduct of p-nonylphenol and ethylene oxide) having a molecular weight of 300 (and a viscosity of 10 centistokes at 99°C.), and 10 parts of water-soluble ethyl-hydroxyethylcellulose (viscosity 100 cps. in 2% aqueous solution at 25°C.) was dissolved in 90 parts of water and used for pasting leather as described in Example 1. Similar results were obtained.

EXAMPLE 9

A mixture of 4 parts of water-soluble carboxymethylcellulose and 60 parts of polyethylene glycol having an average molecular weight of 2000 and a viscosity of 40 centistokes at 99°C was dissolved in 90 parts of water. When used for pasting leather as described in Example 1, this solution gave similar results.

EXAMPLE 10

A mixture of 2 parts of water-soluble methylcellulose and 4 parts of polyethylene glycol (average molecular weight 1000; viscosity at 99°C 17 centistokes) dissolved in 90 parts of water, was used for pasting leather as described in Example 1. Similar results were obtained.

EXAMPLE 11

A solution of 3 parts of sulphomethylcellulose and 10 parts of polypropylene glycol (average molecular weight 600; viscosity at 99°C 10 centistokes) in 90 parts of water was used to paste leather as described in Example 1. Similar results were obtained.

EXAMPLE 12

A mixture of 2 parts of ethyl hydroxyethylcellulose of the type used in Example 2, and 4 parts of trimethylolpropane, dissolved in 90 parts of water, was used for pasting leather in the manner described in Example 1 and with similar results.

WHAT WE CLAIM IS:—

1. A method of treating leather, which comprises applying to a sheet of leather a thin layer of an adhesive composition comprising as essential constituents a water-soluble cellulose derivative and a water-soluble polyhydric alcohol having 2 to 6 hydroxyl groups in the molecule or a mono-ether of such a polyhydric alcohol, the said polyhydric alcohol or ether having a viscosity not above 100 centistokes at 99°C., adhering the sheet of leather by means of the adhesive composition to a plate, and drying the leather and composition.

2. A method according to claim 1, in which the drying is effected at 30°—50°C.

3. A method according to claim 1 or 2, in which the polyhydric alcohol is a polyalkylene glycol.

4. A method according to any one of the preceding claims, in which the water-soluble cellulose derivative is a water-soluble cellulose ether.

5. A method according to claim 4, in which the cellulose ether is a water-soluble ethylhydroxyethylcellulose.

6. A method according to any one of the preceding claims, in which the weight ratio of the cellulose derivative to the polyhydric alcohol or ether thereof is between 1 : 10 and 3 : 1.

7. A method according to any one of the preceding claims, in which the composition is applied in solution in water or a mixture of water and water-miscible organic solvent.

8. A method according to claim 7, in which the concentration of the cellulose derivative in the solution is 2—5% by weight, and that of the polyhydric alcohol or ether thereof is 2—20% by weight.

9. A method for treating leather according to claim 1 substantially as hereinbefore described.

10. Leather which has been treated by the method of any one of claims 1 to 9.

11. An adhesive composition suitable for use in the treatment of leather, which comprises a water-soluble cellulose derivative and a water-soluble polyhydric alcohol having 2—6 hydroxyl groups in the molecule or a monoether of such a polyhydric alcohol, the said polyhydric alcohol or ether having a viscosity not above 100 centistokes at 99°C.

12. An adhesive composition according to claim 11, in which the polyhydric alcohol is a polyalkylene glycol.

13. An adhesive composition according to claim 11 or 12, in which the cellulose derivative is a water-soluble cellulose ether.

14. An adhesive composition according to any one of claims 11 to 13, in which the cellulose derivative is a water-soluble ethylhydroxyethylcellulose.

15. An adhesive composition according to any one of claims 11 to 14, in which the weight ratio of the cellulose derivative to the polyhydric alcohol or ether thereof is between 1 : 10 and 3 : 1.

16. An adhesive composition according to any one of claims 11 to 15, in which the cellulose derivative and the polyhydric alcohol or ether thereof are in solution in water or a mixture of water and a water-miscible organic liquid.

17. An adhesive composition according to claim 16, in which the concentration of the cellulose derivative in the solution is 2—5% by weight, and that of the polyhydric alcohol or ether thereof is 2—20% by weight.

18. An adhesive composition according to claim 11 substantially as hereinbefore described.

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